

Compander IC Monolithic IC MM1100

Outline

This IC was developed for use in mobile communication equipment. It is a compander IC incorporating compressor/expander circuits for a significant noise reduction effect without complicated external circuitry. On the transmission side, the dynamic range of audio signals is compressed by the compressor circuit; on the receiving side, the expander expands the signals. As a result the dynamic range over the transmission channel is reduced logarithmically by one-half.

Features

1. Can be driven at low voltages (down to 2.4V)
2. Compression and expansion circuits enable suppression of unwanted radio waves
3. Consumption current 2.8mA typ.

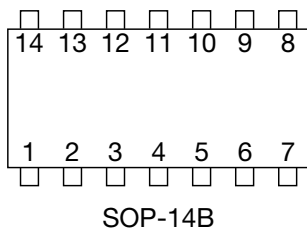
Package

SOP-14B (MM1100XF)

Applications

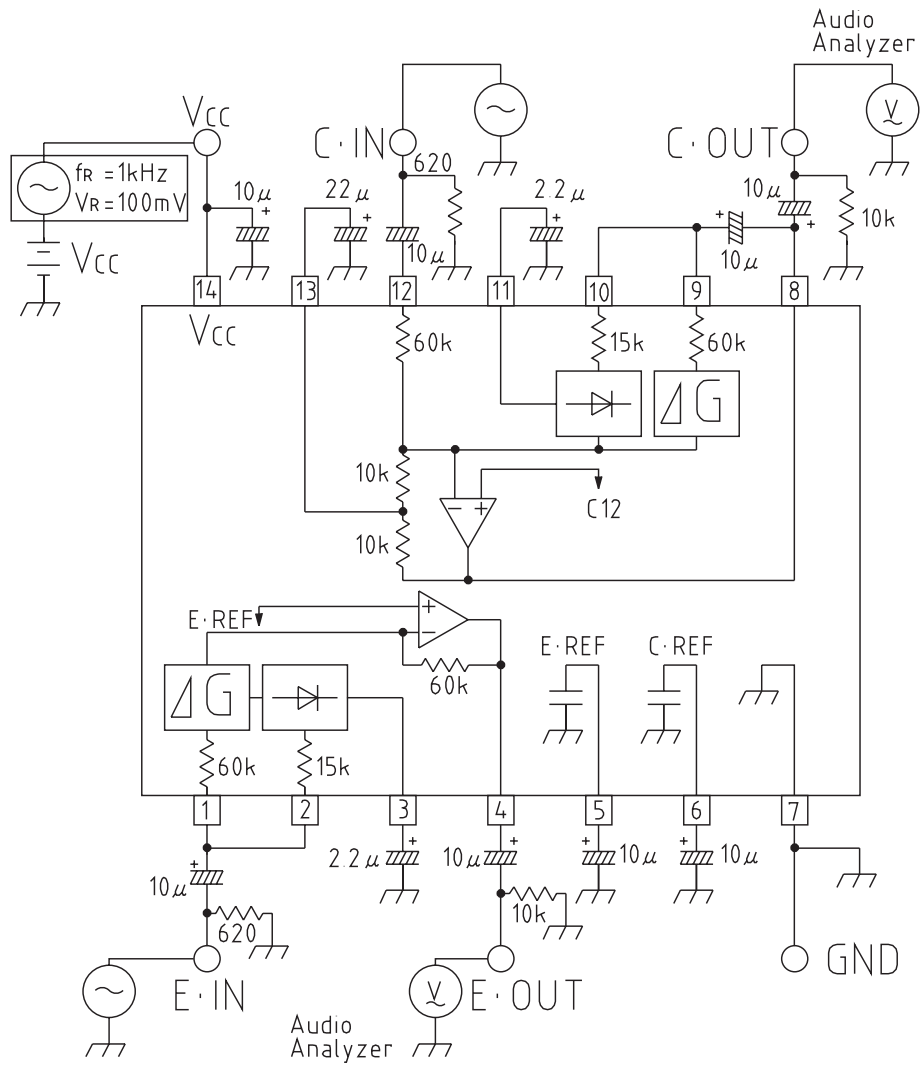
1. Cordless telephones
2. Various mobile communication devices

Pin Assignment



1	E.GIN	8	C.OUT
2	E.RIN	9	C.GIN
3	E.RECT	10	C.RIN
4	E.OUT	11	C.RECT
5	E.REF	12	C.IN
6	C.REF	13	C.NF
7	GND	14	V _{cc}

Block Diagram



Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	T_{STG}	-40~+125	°C
Operating temperature	T_{OPR}	-10~+70	°C
Power supply voltage	V_{CC} max.	-0.3~+8	V
Allowable loss	P_d	350	mW
Operating voltage	V_{OP}	+2.4~+7	V

Electrical Characteristics (Except where noted otherwise, Ta=25°C, Vcc=3V, fin=1kHz, VR=0mVrms)

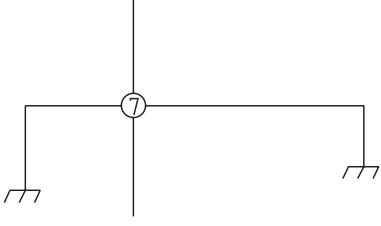
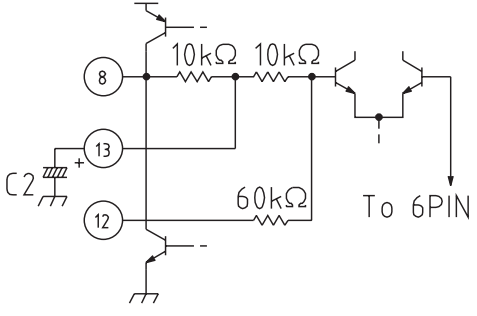
Item		Symbol	Measurement conditions	Min.	Typ.	Max.	Units
	Consumption current	Icc	No signal	1.8	2.8	3.8	mA
	Compressor reference voltage	Vrefc	6PIN DC voltage	1.3	1.4	1.5	V
	Expander reference voltage	Vrefc	5PIN DC voltage	1.3	1.4	1.5	V
Compressor unit	Input reference level	Vinc	Voc=300mVrms, VIN=0dB	100	120	145	mVrms
	Gain error difference *	Gec1	VIN=-20dB	-0.5	0	0.5	dB
		Gec2	VIN=-40dB	-1.0	0	1.0	dB
	Distortion	THDC	VIN=0dB		0.3	1.0	%
	Output noise voltage	Vnc	No signal (CCITT)		2.5	5.0	mVrms
	Limit voltage	Vlimc	THD=10%	1.20	1.40	1.60	Vp-p
	Crosstalk	CTc	EXPVIN=0dB		-45	-35	dB
Ripple rejection ratio	RRc	VR=100mVrms, fr=1kHz		-20	-12	dB	
Expander unit	Input reference level	Vine	Voe=300mVrms, VIN=0dB	310	375	450	mVrms
	Gain error difference *	Gee1	VIN=-10dB	-0.5	0	0.5	dB
		Gee2	VIN=-20dB	-1.0	0	1.0	dB
		Gee3	VIN=-30dB	-1.5	0	1.5	dB
	Distortion	THDe	VIN=0dB		0.15	1.0	%
	Maximum output voltage	Ve max.	THD=10%	700	900		mVrms
	Output noise voltage	Vne	No signal (CCITT)		20	40	uVrms
Crosstalk	CTe	COMPVIN=0dB		-75	-60	dB	
Ripple rejection ratio	RRe	VR=100mVrms, fr=1kHz		-60	-50	dB	

*Gain error difference = (VOUT (dBV) + 10.46dB) - VIN (dB) × G (dB)

G : COMP=0.5, EXP=2

Pin Description

Pin no.	Function	Pin voltage (typ.)	Internal equivalent circuit
1 9	Input pin E Feedback signal input pin	1.4V 1.4V	
2 10	Rectifier input pin E Rectifier input pin C	1.4V 1.4V	
3 11	Rectifier pin E Rectifier pin C The rectifier is a full-wave rectifier. The response characteristics (attack time, release time) are determined by the time constant of the external capacitor C1 and the internal resistance (10kΩ)	0.7V 0.7V	
4	Output pin E	1.4V	
5 6	Reference voltage pin E Reference voltage pin C	1.4V 1.4V	

<p>7</p>	<p>GND pin</p>	<p>0V</p>	
<p>8 12 13</p>	<p>Output pin C Input pin E AC signal cut pin</p> <p>The compressor amp must have a DC gain of unity and AC gain of infinity. In order to satisfy this requirement, a capacitor C2 is connected to pin 13 to remove AC components. The cutoff frequency is determined by the product with the internal resistance (10kΩ)</p>	<p>1.4V 1.4V 1.4V</p>	
<p>14</p>	<p>Vcc pin</p>	<p>3.0V</p>	